Economic

1.0 Economic Program Area Overview

The Economic program area is comprised of four major areas: Economic Census and Surveys; Foreign Trade Statistics, Governments Census and Surveys, and the Office of the Chief Economist.

Economic Census and Surveys

Once every five years, the U.S. Census Bureau is mandated to conduct the Economic Census. This effort involves collecting and processing information from more than 21 million businesses (including non-employers and administrative records data).

The Economic Census provides a complete detailed snapshot of the economic sectors it covers, from the national down to the local level. The sectors covered include:

- **Mining;**
- **Construction;**
- **Manufacturing;**
- **Transportation, Communications and Public Utilities;**
- **Wholesale Trade;**
- **Retail Trade;**
- **Finance, Insurance and Real Estate; and**
- **Services.**

The Economic Census is the foundation for the nation's economic statistics programs. It provides a myriad of information to private and public officials who use census data to make more informed economic plans and decisions.

The statistics produced from numerous economic surveys provide vital information that business and public decision-makers need for success in today's economy. Current economic reports measure the health of our economy by providing a dozen official indicators of current U.S. economic performance, including monthly reports on housing starts, retail sales, international trade and manufacturers' new orders. The U.S. Census Bureau's economic programs provide about two-thirds of the statistics that the Bureau of Economic Analysis needs to produce quarterly Gross Domestic Product estimates. Our programs support the Department of Commerce's mission which directs the U.S. Census Bureau to strengthen the public's understanding of the U.S. economy and its competitive position in the global economy.

The objectives of the current economic statistics programs are:

- **to update, maintain and improve the quality, accuracy, reliability and timeliness of the information collected;**
- **to provide annual, quarterly, monthly and periodic data at the geographic level that are responsive to federal, state, and community needs;**
- **to ensure the continued focus of its programs on statistics that are important to national needs;**
- **to streamline and simplify the reporting process to the maximum extent possible (especially reducing respondent burden); and**
- **to conduct activities required for legislative and planning purposes.**

confidentiality. New initiatives, such as data sharing and efforts to make data more accessible and useful, require us to re-examine confidentiality protection: are respondents willing to give up some confidentiality protection for reduced reporting burdens? Does the timeliness or type of information affect confidentiality concerns? How would changes in U.S. Census Bureau confidentiality policy affect program area participation?

The business register is the cornerstone of our economic statistics programs. If the register is to capture rapid changes in economic structures, business organizations, and record keeping practices, we will have to make substantial improvements to it. We are satisfying the ever-growing demands of internal and external customers. Specifically:

- **The register will be the repository for the most current and comprehensive information available about business. Businesses will be linked and easily accessible through the register.**
- **The register will be flexible enough to satisfy all survey demands, both those of existing and internal customers as well as new, external customers. Among the improvements required are new organizational linkages and improved classification information.**
- **Users will have access to the register in a manner that permits them to satisfy their requirements easily and quickly. We will re-engineer register processing operations that are bottlenecks or potential bottlenecks to census or survey processing.**

The Economic program area will re-engineer key business processes. Rather than seeking solutions for existing problems, our focus will be on fundamentally rethinking our processes, perhaps eliminating entire steps or combining steps when possible, or redesigning processes so they can satisfy multiple, common requirements.

Foreign Trade Statistics

The Foreign Trade Division formulates, develops and implements plans and programs for collecting, processing, and disseminating statistical data relating to the United States merchandise trade with foreign countries and U.S. possessions.

The Foreign Trade collects, compiles, and presents comprehensive foreign trade data. It is the sole source of the official statistics on United States merchandise trade with foreign countries, providing both macro- and microdata on U.S. exports, imports, and related transportation. The Foreign Trade Division provides collection and processing services to other government agencies, private contractors, and public sector organizations. It provides for content design, analysis, and dissemination of both monthly and annual foreign trade statistics.

We derive detailed information about import and export transactions from a variety of sources, some electronic and some keyed paper documents. The main electronic collection system for imports is the U.S. Customs based system: Automated Broker Interface. The National Processing Center keys and transmits import/export transaction information filed on paper documents. Export electronic data collection systems include the data exchange with Statistics Canada, and the Automated Export System. At the end of 1999, the Automated Export Reporting Program will be discontinued. We hope that reporters using this program will switch to the Automated Export System. Our Puerto Rico office also processes and transmits export paper documents for U.S./ Puerto Rico trade.

Foreign Trade Division's work encompasses three major programs or functional areas: Import Statistics, Export Statistics, and

1.1 Economic Program Area Products, Services, and Customers

Economic Census and Surveys

The major uses for Economic Census data are to:

- **provide a statistical framework for economic surveys;**
- **measure and track changes in economic activity;**
- **calculate composite and detailed measures of the nation's economic activity;**
- **provide measures to plan and monitor public economic programs and analyze related public policies; and**
- **provide information to aid in private sector planning and management.**

Current economic surveys provide up-to-date, high quality economic statistics and meet information requirements measuring performance in the manufacturing sector, the business community (service and distributive trade activity), characteristics of new housing and value of new construction, as well as federal expenditure data on a geographic basis. In addition, our surveys provide statistics on imports, exports, and the balance of trade between the United States and its international trading partners. Our customers for these products include private sector companies, government agencies and departments, non-profit organizations, academic institutions, and private individuals.

As we processed the 1997 Economic Census we made progress toward meeting the following goals:

- **standardizing products so data users could more easily compare data across economic sectors;**
- **consolidating production and dissemination processes across the Economic Directorate to improve the timeliness of our data products; and**
- **moving from printed reports to electronic products.**

We create a variety of products as output from our surveys and censuses. Among these are:

- **printed reports (although we will be drastically cutting back on these for both our censuses and surveys);**
- **Internet data on the U.S. Census Bureau's website and the American FactFinder website; and**
- **CD-ROMs.**

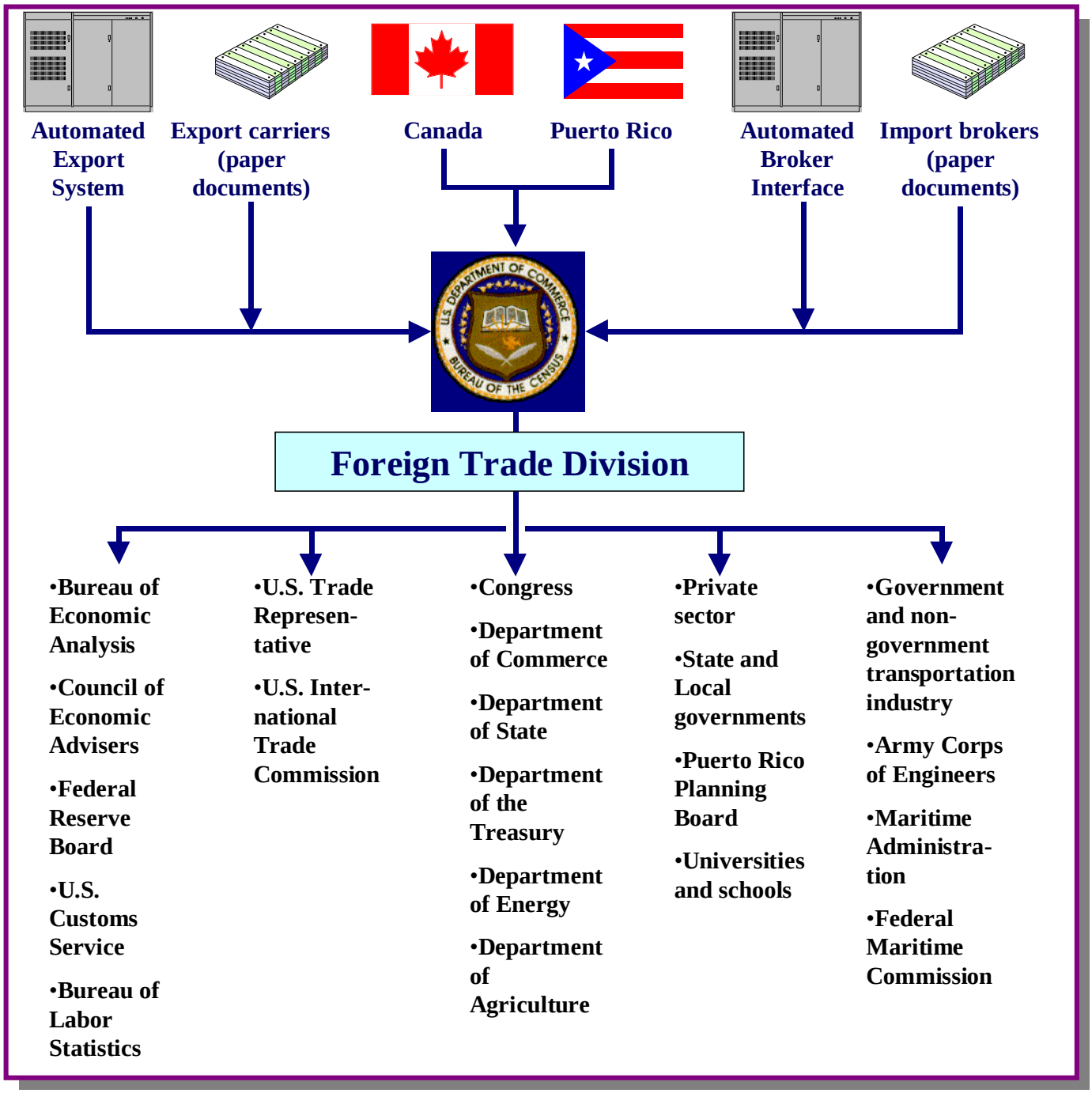

Figure 1: Foreign Trade Customers

Export Statistics

The Export Statistics program focuses on compiling monthly export foreign trade statistics from export documents collected by the U.S. Customs Service and from information provided electronically directly to the Foreign Trade Division by exporters, freight forwarders, and carriers. This program also includes automated data on U.S. exports provided by Statistics Canada under a data exchange program between U.S. and Canadian agencies. This export information covers all shipments individually valued over $2,500 for all countries; the Division estimates data for shipments valued under $2,500.

Transactional Export Data Used

Program Output	Sample Size	Universe
Monthly & Annual Export Trade Statistics	All export transactions over $2000	1.7 million records per month

Data Users and how they use Export Statistics

Data Users	Use of Export Statistics
Bureau of Economic Analysis, Council of Economic Advisers, Federal Reserve Board, and Department of Treasury	Develop the export components of the merchandise trade figures for the balance of payments and Gross Domestic Product accounts
U.S. Trade Representatives	Conduct trade negotiations under the General Agreement on Tariffs and Trade
U.S. Department of Commerce	Implement and monitor international agreements such as the U.S./Canadian Free Trade Agreement; promote export growth. Monitor and control exports on national security, foreign policy, and short supply commodities
U.S. Congress	Monitor agency programs relevant to export expansion, quotas, and controls
U.S. Department of Agriculture	Monitor, evaluate, and plan agricultural development programs and quotas
Private sector	Employ the data in share-of-the-market analysis and market penetration studies; determine marketing policies and strategies

collected on the federal government is also used in administering federal grant programs. At the state and local levels, officials recognize the value of the U.S. Census Bureau's databases: these databases provide and represent the only nationwide repository covering rich and accurate data on all state and local government financial and employment activities.

Governments Division also conducts a variety of special studies at the request of other federal or non-federal organizations. In the past, these have covered such subjects as the criminal justice system, educational data and government employee characteristics and compensation.

Supported by the Governments Division's core expertise in public sector statistics are several programs undertaken for other federal agencies on a reimbursable basis. We conduct major programs for the Office of Management and Budget, the Department of Justice, and the Department of Education. The Governments Division collects data on postsecondary education, elementary and secondary education, and libraries for the National Center for Education Statistics.

For the Office of Management and Budget, the division collects data on all federal domestic assistance programs and on the federal expenditures by geographic area. It also operates a national clearinghouse for audit reports from state and local governments and from nonprofit organizations submitted under provisions of the Single Audit Act of 1984.

For the Department of Justice (specifically the Bureau of Justice Statistics), the Governments Division maintains a national directory of justice agencies and conducts periodic censuses and surveys covering the characteristics and population of prisons, jails, and juvenile facilities. We also collect data on the population under probation/ parole supervision, administrative statistics for law enforcement agencies, and on sentencing in felony courts. We produce a special report each year on government expenditures and employment for criminal justice activities. For the Office of National Drug Control Policy, we collect government expenditures for drug control activities.

For the Department of Education, (specifically for the National Center for Education Statistics), the Governments Division collects for three associated programs: the Integrated Postsecondary Education Data System; the Common Core of Data, which covers elementary and secondary education; and the library data program.

Office of the Chief Economist

The Office of the Chief Economist directly supports, both at Headquarters and at the research data centers, research of analysts from academia and the public and private sectors. These analysts perform research that cannot be replicated in any other research environment because they must have direct access to census microdata. Historically, this Office has primarily provided access to establishment microdata, but we are increasingly becoming a conduit for access to proprietary versions of demographic microdata. Due to the quality and availability of the microdata collected and compiled, the Office of the Chief Economist attracts and supports the research of distinguished economists and social scientists. Note that we provide the access to non-publicly available data in a secure environment. Moreover, access is on a fee basis, with the fee structure

2.0 Economic IT Support

Economic Census and Surveys

The following is a general depiction of the IT environment supporting the processing of the Economic Census and most economic surveys.

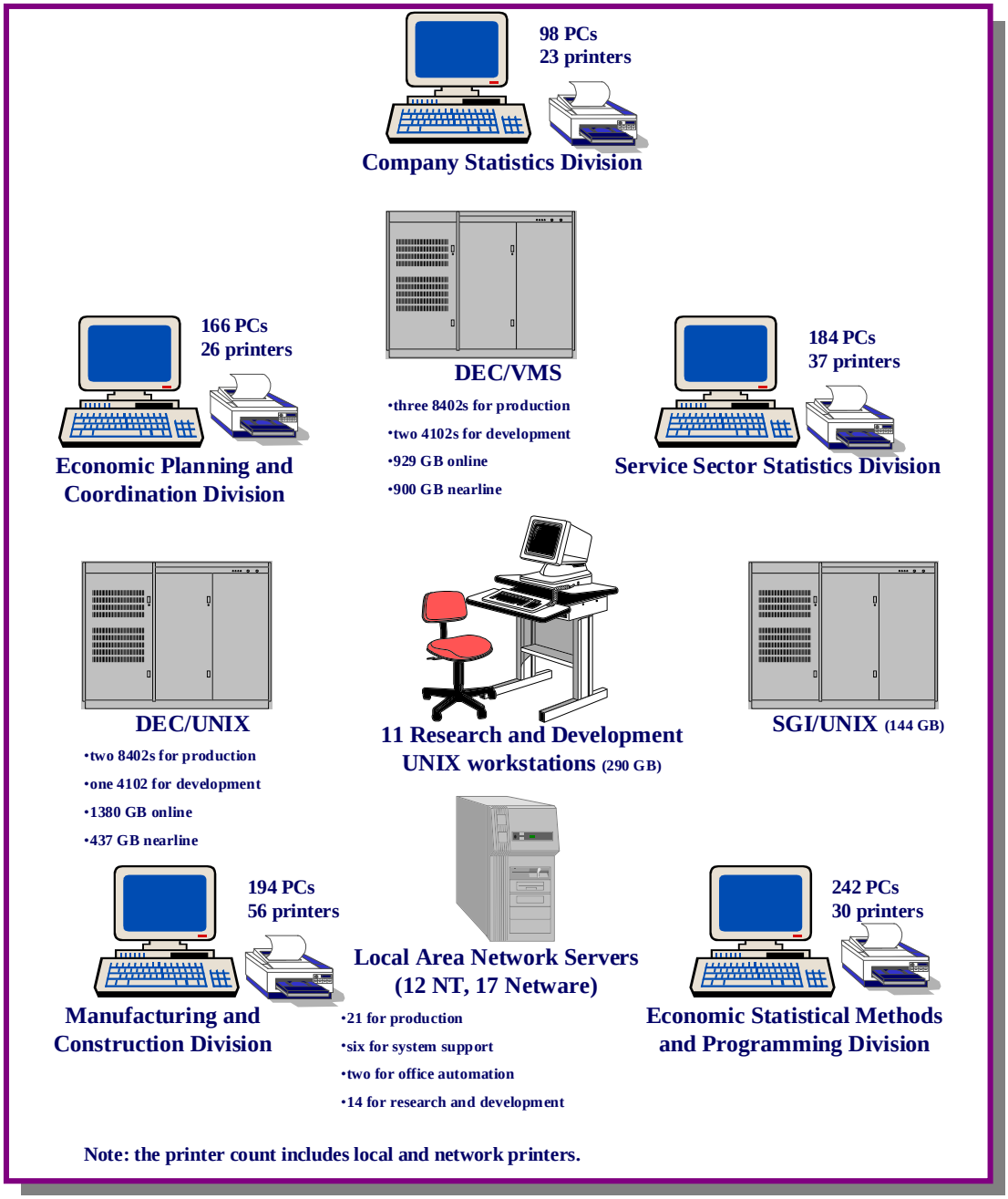

Figure 2: Economic Census and Surveys Computing Environment

automation servers, 10 system support servers (redundancy, backup, test, system management functions), and over 1,000 desktop PCs. The network operating system installed on our fileservers is either Microsoft Windows NT or Novell Netware. With the rapid change in technology, vendors are constantly offering superior hardware. Mechanical equipment suffers loss of reliability and efficiency over time. Hardware bought today is likely to be obsolete in three to five years; we strive to continually refresh our equipment as funds become available. Our primary goal is to satisfy the needs of the users while simultaneously employing strategies to more effectively manage and support this large and complex network environment. To this end, we have implemented, or are in the process of implementing, several strategies:

- **deploy a Common User Interface to each desktop so that each employee throughout the Directorate has the same "look and feel" on their PC;**
- **standardize on and provide support for a common set of software products for the Directorate;**
- **transfer help desk contact to central IT's Computer Support Center, with support from Economic Statistical Methods Programming Division staff;**
- **use remote Local Area Network management tools (especially automated ones) and remote software installation;**
- **continually assess technology to ensure we have the best solution to meet our users' current and future needs;**
- **replace up to one-third of our Directorate's PCs and up to one-fourth of our servers each year (depending on available funds).**

(continued)

- **employ a Directorate-wide Local Area Network (LAN) Steering Committee to guide future LAN direction and facilitate communications between users and support staff;**
- **consolidate our servers in the Bowie Computer Center;**
- **develop Service Level Agreements with the IT Directorate to ensure reliable and robust LAN/WAN performance and timely service;**
- **select and configure hardware and software to comply with U.S. Census Bureau standards and uniform products; and**
- **deploy the automated Y2K tool Check-2000, to assess Y2K hardware and software compliance for all servers and PCs.**

Our network environment supports the following strategies described in the 1999 Strategic Plan:

- **Strategy 1: Develop Service Level Agreements and performance metrics, and assess results of customer satisfaction relative to their expectations;**
- **Strategy 2: Improve the operating environment by consolidating appropriate computer processing equipment in the state-of-the-art Bowie Computer Center;**
- **Strategy 3: Improve Local and Wide Area Networks to make them robust, reliable, scalable and secure to meet future needs;**
- **Strategy 4: Standardize desktop workstations;**
- **Strategy 7: Solve the Year 2000 (Y2K) problem; and**
- **Strategy 8: Redesign legacy systems to operate in an open systems environment.**

The Office of the Chief Economist's IT infrastructure is entirely based on government and industry standards. The computer environment is made up of POSIX-compliant workstations and servers networked via the TCP/IP protocol. The computers exist in a distributed environment. We assign one or more workstations to each project within the center; we carefully configure the workstations to provide the optimum resources necessary for the specific project. Moreover, each workstation is highly scalable via the addition of memory, disk resources, or faster processors. The entire environment is therefore highly flexible while remaining interoperable with the majority of the U.S. Census Bureau's computer systems.

Supporting a "Digital" Department of Commerce

The Economic program area has, for several years, placed major emphasis on electronic methods of conducting business. We have sharply curtailed some of our print publications and we publish much of our data via the Internet. Computerized Self-Administered Questionnaire and Internet reporting are available options on many surveys. The Economic program area has several initiatives in progress with many of our major reimbursable partners to collect data over the Internet. We collect a significant percentage the data from state and local governments and other federal agencies in electronic form.

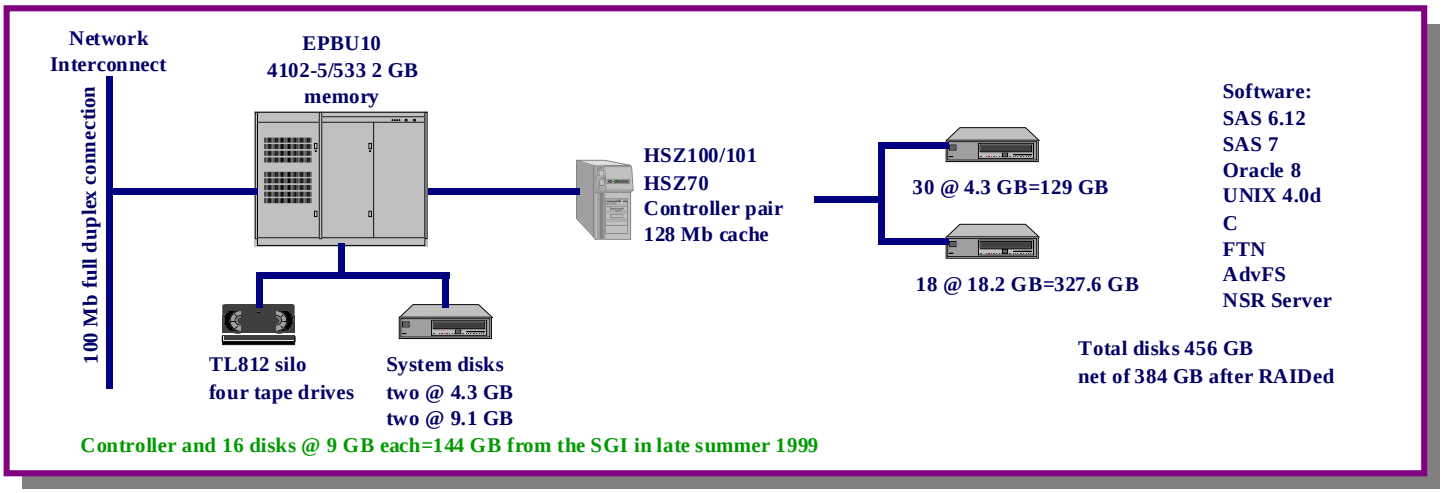

Figure 4: UNIX Development EPBU10

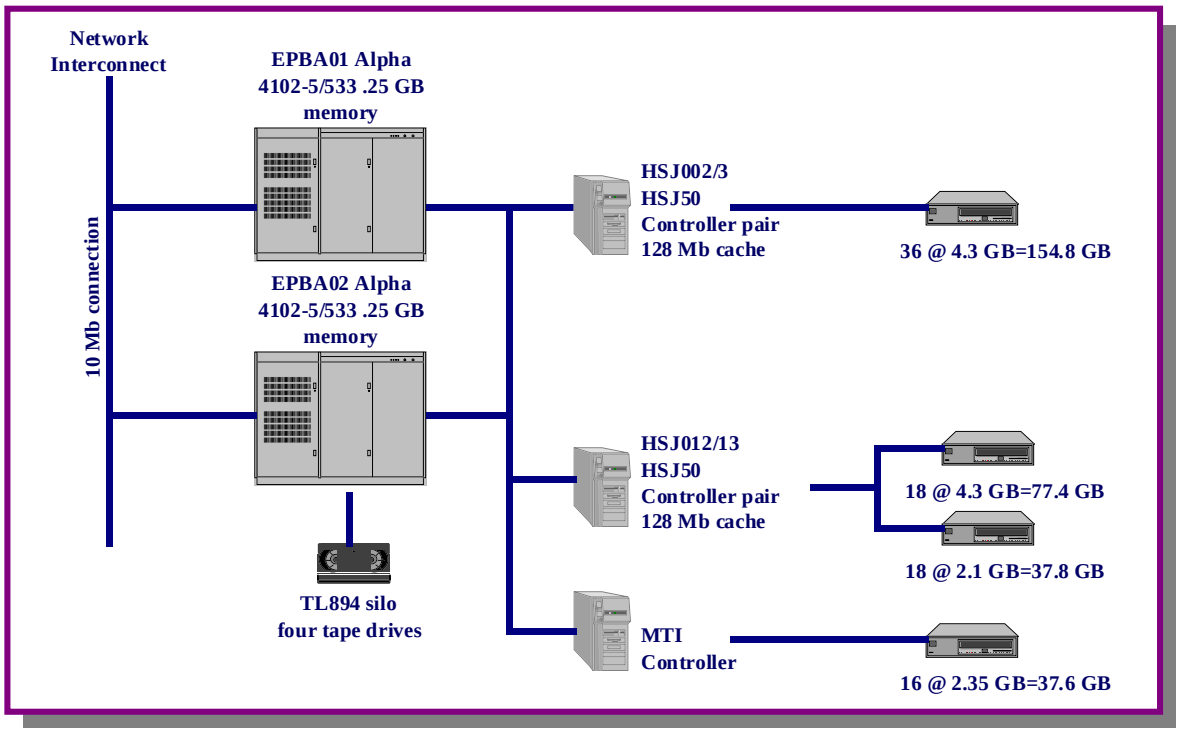

Figure 5: VMS C3 Development Cluster

Foreign Trade Statistics

Currently all production processing, office automation, management, analysis, data sharing, and product generation functions are Local Area Network-based. The Core Import and Export Production Systems are large-scale PC workstations. Processing data for these systems comes from servers attached to the Local Area Network.

Figure 7, below, depicts the information sources and IT processes used to generate Foreign Trade Statistics.

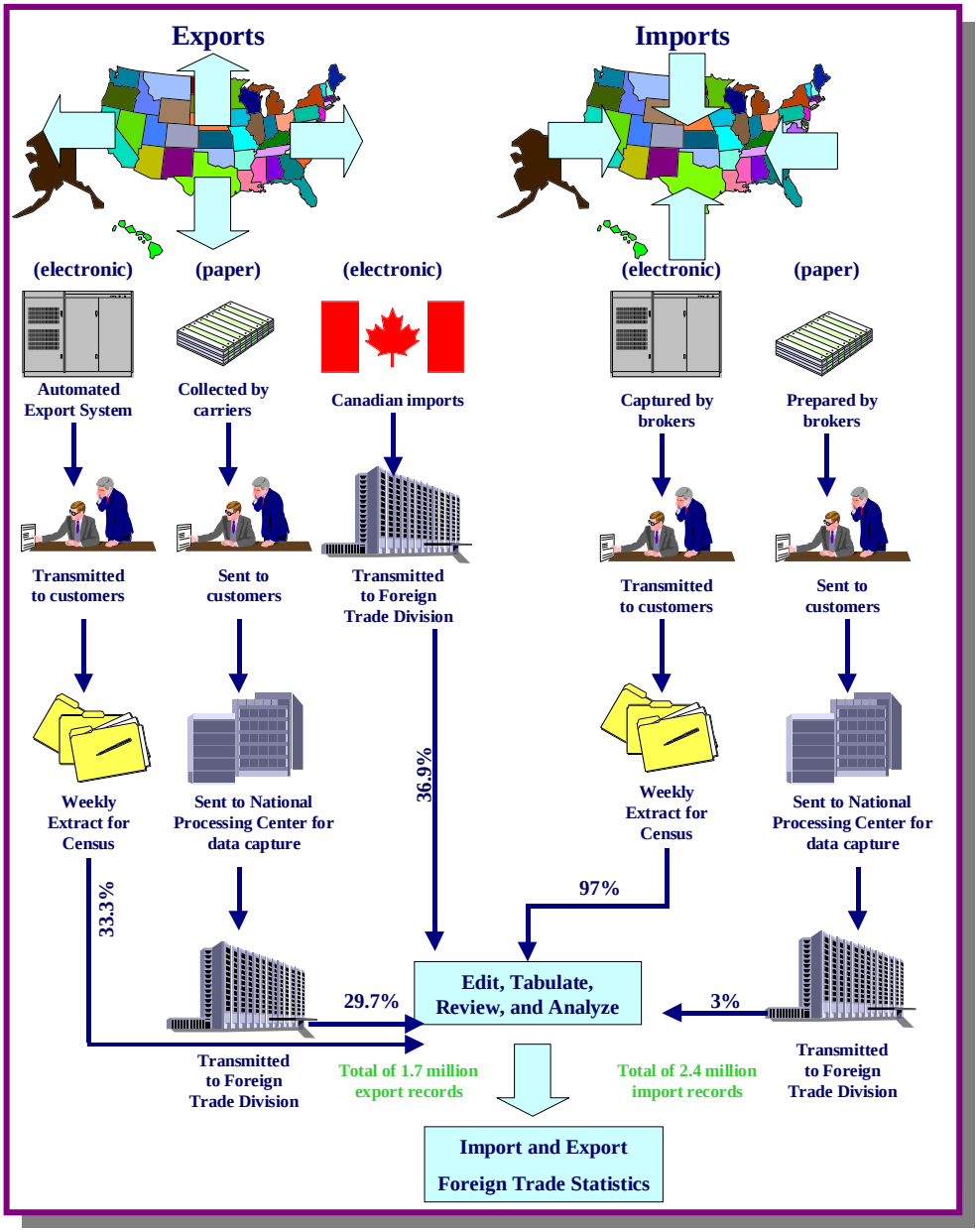

Figure 7: Information sources used for Foreign Trade Statistics

Governments Census and Surveys

The Local Area Network infrastructure supports Governments Division programs. There are no major IT systems and no new IT initiatives.

We have based this open systems environment on a distributed client-server architecture built on a Local Area Network. Approximately 180 Intel-based workstations run Windows 98. Several Windows/NT servers provide Local Area Network storage and database services through Oracle. Several network-based laser printers provide printing services; we are gradually replacing the remaining desktop laser printers with network printers. A fax server hosted on one of the NT servers provides network fax services.

A Windows/NT server located in Jeffersonville provides Oracle database services and file services for three clerical units who prepare data for our division. A Windows/NT-based server on the public Internet segment supports electronic reporting activities.

The underlying architecture—that of a network based on open systems standards—is both adequate for current needs and flexible enough to incorporate changing requirements. We do not anticipate a fundamental change in the near future. Incremental improvements will consist of replacing network components and expanding capacity. We expect to expand storage capacity, add servers, and improve network capacity. We will replace obsolescent PC workstations and servers on a three-year cycle.

Office of the Chief Economist

We have designed the Economic Microdata warehouse prototype as a vehicle to permit us to store all of the U.S. Census Bureau's economic microdata together in a common format and with a common metadata format. This will serve two purposes: first, to allow U.S. Census Bureau analysts access to historic data so as to review current surveys and censuses in a user-friendly format; and second, to simplify the creation of data subsets, both longitudinal and across surveys.

The Office of the Chief Economist is developing the data warehouse prototype with the Economic Statistics Methodology and Programming Division (ESMPD). The Office will provide computer resources and will help move historical data into the warehouse structure. ESMPD personnel are developing the software system; Office of the Chief Economist personnel will be trained to help as other duties allow.

The data warehouse prototype will exist on a single POSIX server, located in Washington Plaza II, with a substantial amount of disk space (approximately one terabyte for this prototype version). We will create data subsets here via intelligent data extraction tools and download them to local workstations or PCs for analysts to use.

Data will exist as fully documented and labeled SAS data sets. We are developing all software in SAS, making the data and the software highly portable. The only exception is the documentation server, which will be a Web-enabled Oracle database. The software interface for the upcoming proto-

Economic Program Area Milestones, FY 99

Description	Estimated		Actual		Progress to Date
	Start Date	Finish Date	Start Date	Finish Date	
Economic Census and Survey					
Electronic Data Dissemination: Determine specific user (content, media, access, and distribution) requirements for the Economic Current Surveys	02/97	04/99		04/99	Completed.
Standard Economic Processing System (StEPS): Migrate production to DEC UNIX machines in Bowie	12/98	05/99		05/99	Completed.
DEC UNIX Systems: Move all StEPS development onto centralized UNIX machines in Bowie	02/99	06/99		06/99	Completed.
Electronic Data Collection: Conduct 1998 ASM Imaging/OCR Pilot	12/98	06/99		06/99	Completed.
Center for Economic Studies: Research Data Center (RDC) Expansion – Complete formulation of data distribution methodology	12/98	07/99			In progress.
Center for Economic Studies: Research Data Center (RDC) Expansion – Complete hiring and training of RDC support employees	12/98	08/99			In progress.
DEC UNIX Systems: Implement initial digital UNIX tru-clustering on UNIX production machines	03/99	09/99			In progress.
Electronic Data Collection: Evaluate 1998 ASM Imaging/OCR Pilot	06/99	09/99			In progress.
Foreign Trade Statistics					
Conversion to SAS	05/98	11/98		11/98	FY 1998 project databases completed.
Local Area Network Technology	04/97	12/98		12/98	3 new servers along with 100MB lines for 132 users to speed up data transfer on the LAN were installed.
FYD Y2K Migration	05/98	01/99		01/99	Completed.
Puerto Rico Trade Data Staff Equipment Upgrade	05/98	11/98		04/99	Completed.
NPC Automation	10/97	04/99		04/99	FY 1999 Key Entry III Projects completed.
Expansion of Electronic Dissemination of Data Products and Trade Information: Work with trade inquiry and technical staff to (1) ascertain trade data most wanted by customers and (2) hardware, software and technical skills needed to develop this information	03/99	06/99		06/99	Completed.

These systems will support the Standard Survey Processing System, the Time Series Analytical Repository, the Commodity Flow Survey being moved from the Silicon Graphics Inc. machine, Governments Division survey work, ad hoc data analysis, and other miscellaneous projects.

Electronic Data Collection: the primary objectives of our Electronic Data Collection initiative are to reduce respondent burden, increase response rate, and improve data quality. Our plan concentrates on increasing electronic data collection in the following four areas:

- **the Automated Export System;**
- **the Company Organization Survey and Annual Survey of Manufacturers;**
- **Quarterly Financial Reports; and**
- **Retail Sales Surveys.**

In some cases, these efforts are prototypes which will test the viability and effectiveness of using different types of automatic data capture technologies.

We have enlisted a contractor to develop a generalized instrument design tool that will allow analysts to interactively design questionnaires and deploy them in various electronic data collection instruments.

For the past several years, in cooperation with the Computer-Assisted Survey Research Office, we have been testing various automatic data capture technologies. These technologies, such as Computer-Assisted Telephone Interviewing, Electronic Data Interchange, Touchtone Data Entry, Computerized Self-Administered Questionnaires and Imaging/Optical Character Recognition have been deployed successfully, on a limited basis for the Economic Census and several surveys. We are also starting to explore the use of the Internet for data collection. At this point, we do not anticipate any significant investment in IT equipment or infrastructure to support these technologies.

In the past year, we have made the following progress:

- **performed data capture for the Survey of Minority Owned Business Enterprises via Optical Character Recognition/Optical Mark Recognition, using Decennial program area equipment;**
- **acquired and installed imaging hardware and software for the Annual Survey of Manufacturers and Company Organization Survey pilots;**
- **converted DOS-based Computerized Self-Administered Questionnaire instruments (for Annual Survey of Manufacturers and Company Organization Survey) to Windows;**
- **completed 1998 Company Organization Survey Internet Computerized Self-Administered Questionnaire prototype; and**
- **continued to develop generalized instrument design tool for Economic surveys.**

Electronic Data Dissemination: during 1998, in conjunction with the Marketing Services Office, we conducted a survey of U.S. Census Bureau Current Economic Program customers. The findings of this survey will serve as direct input into determining the specific user requirements (content, media, access and distribution) for the Economic Current Surveys. Ultimately, this will help us define and build a back-end to the Standard Economic Processing System for Surveys.

Based on specific user requirements from the survey of Current Economic Programs users, the Integrated Information Solutions (IIS) program will oversee product creation and dissemination activities for the Current

Because all of the software we used to develop this project is already covered under U.S. Census Bureau enterprise initiatives, we will not incur additional software costs. Although the data transfers resulting from this project will require additional network bandwidth, we have already planned a network upgrade.

We have met all milestones on schedule. During FY 99, the development team is experimenting with new metadata structures and is creating a web-enabled prototype for very limited access and demonstration. In addition, Center for Economic Studies staff members are beginning to develop documentation.

Standard Statistical Establishment List Redesign: for the 2002 processing year, we plan to re-engineer and implement a redesigned, improved version of our business register. Our overriding objective is to promote the quality of business statistics by modernizing the register and improving the quality, timeliness and effectiveness of the functions and services it provides. The primary use of the business register is to provide list frames for the planning and execution of sample designs for most of the U.S. Census Bureau's economic surveys and censuses. Secondary uses include serving as an administrative data repository, a principal source of statistical information list sharing, a tabulation-ready file for reimbursable projects, a longitudinal file that tracks units through reorganizations and changes in ownership, and a research resource.

The primary goal of the IT infrastructure supporting the business redesign will be to expeditiously satisfy user requirements. This includes the ability to flexibly and remotely access register data. The system requirements for the Standard Statistical Establishment List's redesign will be an opportunity to set future data processing standards for the Economic program area. We will design file structures to make data easily accessible using common software tools and will be self-defining according to Economic-wide metadata standards. Within an open systems computing environment, access to common tools will provide analysts and other data users direct access to current and historical data sets to facilitate data query, extraction, tabulation and analysis. In this way, we will use IT to realize the vision of an enterprise repository of economic statistics.

A framework team was formed in October 1998, composed of representatives from the Economic Planning and Coordination Division and the Economic Statistical Methods and Programming Division. That team is defining the functional requirements for a redesigned business register that will provide continuous company and establishment data and allow links to survey reporting units other than enterprises and establishments.

In July 1999 the Framework Team will present a blueprint for a modern business register which integrates with the U.S. Census Bureau's metadata repository and also provides links to census and current survey (StEPS) systems; we will also provide a plan for implementing this re-engineered system. Current plans call for developing and testing this new register design on the 2001 Annual Survey of Manufactures/Company Organization Survey program and fully replacing the old Standard Statistical Establishment List with the new register system for the 2002 Economic Census.

Economic Program Area Milestones, FY 00					
Description	Estimated		Actual		Progress to Date
	Start Date	Finish Date	Start Date	Finish Date	
Electronic Data Collection: Implement CSAQ for QFR as test of Generalized Instrument Design Tool	10/99	12/99			
DEC UNIX Systems: Convert a VMS 4100 to a UNIX for development	12/99	02/00			
DEC UNIX Systems: Implement Digital UNIX clustering on UNIX development machines	12/99	04/00			
Electronic Data Collection: Implement imaging/OCR for 1999 ASM/COS	11/99	06/00			
Standard Economic Processing System (StEPS): Migrate year 3 surveys to StEPS	05/99	07/00			In progress.
Electronic Data Collection: Conduct OCR Pilot for 1999 COS	09/99	09/00			
Electronic Data Dissemination: Conduct pilot project to disseminate products from 2 annual surveys via IIS	10/99	09/00			
Foreign Trade Statistics					
Core Import and Export Processing	05/98	12/99			All changes were completed for the 1999 FTD statistics.
AES Data Capture System Web Interface: Design, Develop , test and implement an Internet-based AES system for the keying and transmittal of SEDs	05/99	12/99			In progress.
AES Data Capture System Web Interface: Develop an on-line tutorial and user guide for keying SEDs	05/99	12/99			In progress.
Information Technology refreshment	06/98	12/99			Approximately 100 new desktops were installed during this fiscal year.
Expansion of Electronic Dissemination of Data Products and Trade Information: Create and test information delivery system prototype	07/99	12/99			
Development of Electronic Interactive Analytical Tools for Foreign Trade Data Analysts: Work with subject matter data analysts and technical personnel to establish (1) common data problems and questions, and (2) electronic automated methods which can resolve these problems and answer the data questions	08/99	12/99			
Integration of Electronic Data Capture, Automated Data Processing, Correction and Analysis: Build integrated hardware and software system prototypes	09/99	12/99			

Economic Program Area Milestones, FY 00					
Description	Estimated		Actual		Progress to Date
	Start Date	Finish Date	Start Date	Finish Date	
Office of the Chief Economist					
RDC Expansion: North Carolina RDC opens	10/99	10/99			
Economic Data Warehouse: Second Prototype development	09/99	06/00			

Economic Program Area Milestones, FY 01					
Description	Estimated		Actual		Progress to Date
	Start Date	Finish Date	Start Date	Finish Date	
Economic Census and Survey					
Electronic Data Collection: Continue development of Generalized Instrument Design Tool	01/99	12/00			In progress.
DEC UNIX Systems: Continue age replacement of disk at approximately 400gb per year (depends on funding)	01/00	12/00			
DEC UNIX Systems: Purchase and install 3 additional tape silos (for backup) to be paced offsite from Bowie	06/00	12/00			
Standard Economic Processing System (StEPS): Migrate year 4 surveys to StEPS	05/00	07/01			
Electronic Data Collection: Develop automated Data Capture plan for 2002 Census	09/00	09/01			
Electronic Data Dissemination: Migrate the bulk of remaining annual surveys to IIS	10/00	09/01			
Foreign Trade Statistics					
Development of Electronic Interactive Analytical Tools for foreign Trade Data Analysts: Build and test individual prototype tools	04/00	11/00			
Fully Integrated Data Products Order and Payment System: Create technical training documentation for the order and payment system	10/00	12/00			
Fully Integrated Data Products Order and Payment System: Train staff to use the system with customers	01/01	04/01			
Governments Census & Surveys					
Install new equipment	09/00	10/00			

Progress to date:

Foreign Trade Statistics

Automatic Export System Data Capture System Web Interface: a contractor will develop this real-time, online nationwide system to electronically collect U.S. Shipper's Export Declarations. The system will dramatically reduce the number of paper documents that exporters, forwarders, and carriers file and will reduce manual keying done in Jeffersonville, Indiana. This proposed web-based interface to the Automatic Export System will allow small and mid-sized companies to more easily use this new electronic filing system and will also simplify filing procedures for them by providing online guidance and access over the Internet.

Development of Electronic Interactive Analytical Tools for Foreign Trade Data Analysts: these tools will provide our Foreign Trade Division customers with accurate summary level data and timely quality data analysis. Toolsets will encompass the following:

- **checks to ensure that data are not duplicated or omitted during data capture;**
- **graphics to detect data trends;**
- **interactive extraction capabilities to work with small data samples;**
- **miscellaneous canned queries to answer common data-related questions; and**
- **routines to sort, summarize, and/or combine appropriate data for information or data analysis.**

Integration of Electronic Data Capture, Automated Data Processing, Correction and Analysis: Foreign Trade Division is working toward increasing electronic data dissemination. This goal adds a new layer of complexities to the already complex electronic processing systems. To lay the groundwork for this, the Foreign Trade Division is developing computer systems capable of receiving, editing, reviewing and correcting data upon receipt. The systems will be able to process detailed transaction records received into systems up to two months early and will allow for prior corrections in January and forward. These concurrent processing methods will speed up the production of final trade statistics.

Expansion of Electronic Dissemination of Data Products and Trade Information: at present, Foreign Trade Division electronically disseminates the following via the Internet:

- **monthly data, including trade balances, top trading partners, and selected monthly and historical trade numbers;**
- **educational material on how to use the Automated Export System electronic data capture system;**
- **export commodity classification information;**
- **custom trade data subscriptions paid for by data users; and**
- **current hot interest trade news related to Foreign Trade Statistics.**

Foreign Trade Division is working to provide further customized paid data extract subscriptions. The trade data aggregations will be by customer request and will involve summaries of trade data by country, commodity, district, and port. The data time frames will be current month, annual, and/or historical.

Economic Program Area Performance Measures			
Performance Goal	**Performance Measure**	**Target Performance**	**Current Performance**
Migrate commodity extraction subscription program to electronic dissemination	Percent of program migrated to electronic dissemination	100% by 03/2002	
Improve data quality by lowering numbers of import transactions received too late for the correct processing month	Percent of import transactions received too late for the correct processing month	0.75% by 03/2000	
Improve data quality by lowering numbers of export transactions received too late for the correct processing month	Percent of export transactions received too late for the correct processing month	0.75% by 03/2000	
Integrated editing and summarizing of data to allow more time for data analysis before release	Percent of system completed	100% by 06/2000	
Refresh desktop systems	Number of PCs acquired and installed	33% replaced annually	
Governments Census and Surveys			
Increase data collection through electronic form from state and local governments and other federal agencies	Percent of data collection converted to electronic submission	100%	92%
Refresh desktop systems	Number of PCs acquired and installed	33% replaced annually	92% (55 of 60)
Office of the Chief Economist			
Ensure IT resources are properly maintained	Percent uptime of workstations and servers	99.9%	99.9%
Attract reimbursable income	Number of new projects per year	20%	20%

- **implementing redundancy techniques such as RAID disks and Tru-clustering, to reduce risk of system failures and loss of data;**
- **acquiring near line, slower disk storage for data archiving, thus reducing the amount of data needing to be regularly backed up nightly;**
- **working with the IT Directorate to ensure sufficient bandwidth for streaming backup data; and**
- **coordinating with the Bowie Computer Center to schedule backup and making sure operators and system managers are properly trained.**

Another risk is the difficulty in hiring permanent staff with "in demand" skills. UNIX and VMS system management and database administration are examples of skills not easily found in the employment marketplace. The demand for these skills has escalated commensurate salaries far beyond federal government pay scales. Maintaining staff quality requires extensive training and may take several years, depending on initial experience. Retaining experienced staff is also a problem, resulting in a continuous retraining cycle. In many cases, the staff is forced to learn on the job and consequently are more likely to make mistakes. This situation may result in system downtime, delaying critical processing and production deadlines.

Our risk mitigation strategies include the following:

- **relying on contractors to fill in skill gaps (at sometimes prohibitive cost); and**
- **developing an aggressive hiring, retention and training program.**

The last risk is integration with other U.S. Census Bureau applications. The data processing for many of our surveys is not solely controlled within the Economic Directorate; we rely on ancillary systems and applications managed by other divisions. Some of these are our DEC systems (managed by the Bowie Computer Center), the IT Directorate's telecommunications infrastructure, the Master Control File system and the Data Access and Dissemination System. Sometimes the interfaces between our systems and other systems are not sufficiently robust and configuration management procedures are not well defined. This can lead to integration problems that can cause processing delays and data errors.

Our risk mitigation strategies include the following:

- **improving our communications with other areas of the U.S. Census Bureau;**
- **performing more extensive testing on the application interfaces; and**
- **developing configuration management procedures.**

Governments Census and Surveys

One risk is failure points. We have worked to reduce the risk associated with our IT infrastructure failing. Our risk mitigation strategies include the following:

- **refreshing the technology every three years to reduce the risk of equipment failure (all machines are under an onsite warrantee; and**
- **distribute the workload across several servers to eliminate single points of failure.**

Another risk is telecommunications complexities. Our programs increasingly rely on telecommunication links for collecting, processing, and disseminating data. This year we are updating the Local Area Network wiring to increase capacity and improve reliability. At the same time, we are beginning to see more communication problems at the enterprise level, which is complicated by the fact that since we are located in Washington Plaza, we are more dependent on wide area communications. Telecommunication support is becoming more important for operations because of the following:

Integrating processing with Jeffersonville: as the focus of data preparation shifts from simple batch processes to more complex interactive work, we have to integrate the Jeffersonville operations more closely with our systems; consequently, our reliance on communications necessarily increases. There is also a potential major risk associated with the amount and quality of support that the Jeffersonville technical staff can provide.

Data dissemination: we have revised our data dissemination strategy so that almost all data are released via the Internet. Communications between the servers and onto the Internet are a vital part of this.

Data collection: we are placing a major focus on collecting data electronically. Good communications support is obviously the central factor in this program.

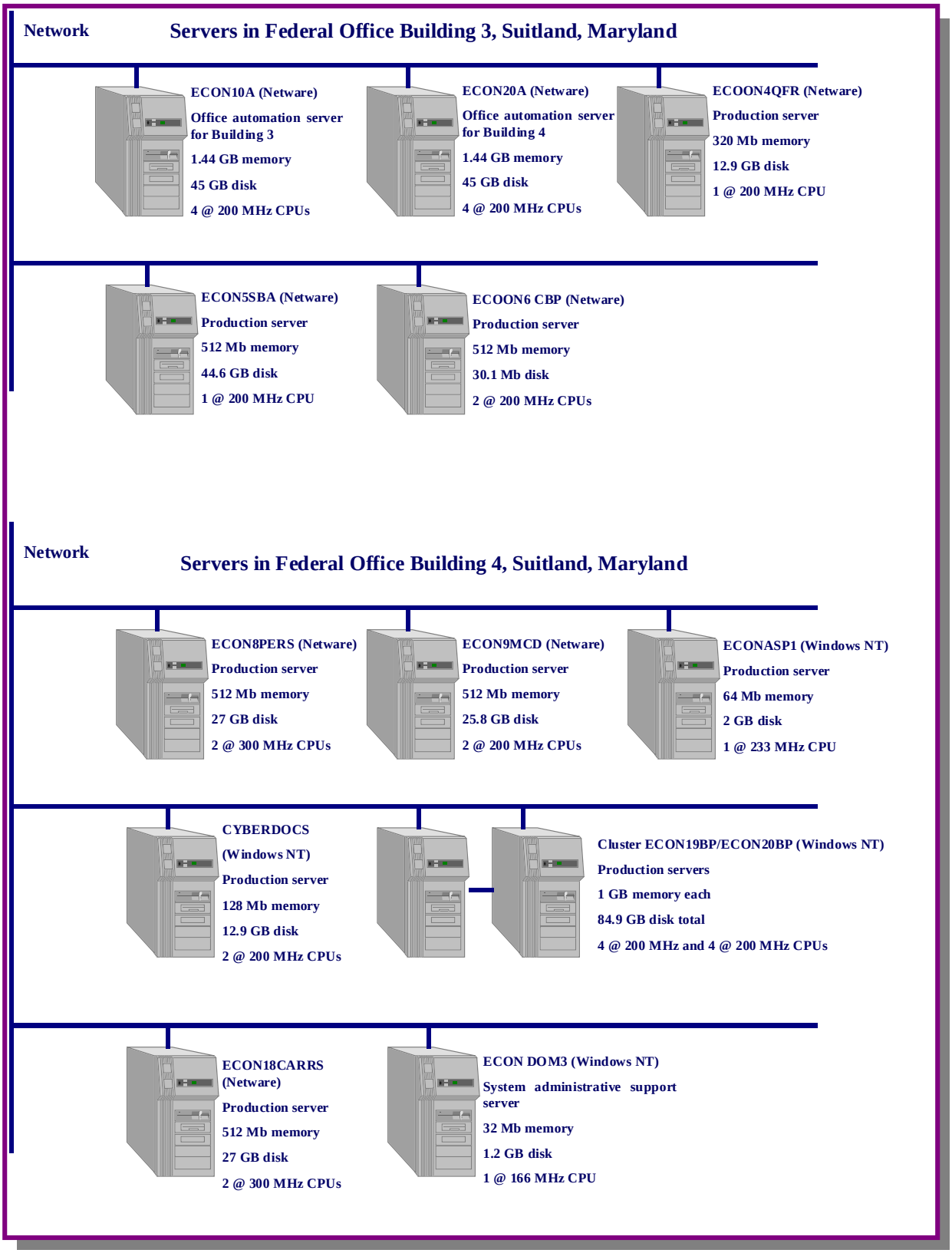

Figure 8: Local Area Network Servers in Federal Office Buildings 3 & 4

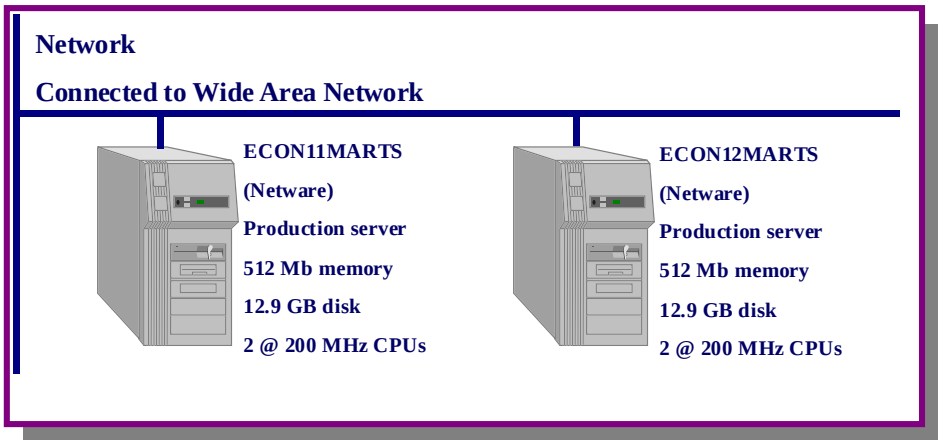

Figure 10: Economic Census and Surveys Local Area Network at National Processing Center

Foreign Trade Statistics

The current Foreign Trade Division processing and telecommunication architecture consists of a comprehensive system of networked and stand-alone microcomputers, file storage servers, printers, and peripheral systems (i.e., CD-ROM, DLT-tape storage, 4mm DAT tape subsystems, 3480 cartridge subsystems, etc.). Software and inter-connectivity programs and tools are integrated into the data processing service for the division. Further discussion follows describing various aspects of the Foreign Trade IT infrastructure.

Local Area Network (LAN): the Foreign Trade Division's LAN is a component of the U.S. Census Bureau's enterprise telecommunications infrastructure. All operations currently use the U.S. Census Bureau's Fiber Data Distributed Interface ring. The IT Directorate's Telecommunications Office Local and Wide Area Network staffs provide primary LAN-related cable plant and routing support. Foreign Trade Division relies on in-house experts to administer and maintain the file server and backup infrastructure.

Our file server infrastructure consists of several subsystems. We accomplish most of the Core Import and Export production processing using high-powered PC workstations. To provide further support to the Core Import and Export processing of Foreign Trade Statistics, we installed a rack-mounted Windows NT-based subsystem consisting of two each dual processor (200 MHZ) Compaq Proliant 5000/R CPUs, 128MB RAM, 30GB Raid-5 Hot Swap mass storage, and 30GB DLT backup tape Subsystem. We have installed 100Mb/sec LAN capability. To support the remainder of the LAN, we have installed 24 Novell 4.11 based microcomputer shared access file, client, and applications servers with 100Mb/sec LAN capability. The Foreign Trade Division staff is continually demanding more and more disc storage. We project that during the coming year we will bring four or five more servers on line for special statistical projects, including one to

print professional labels for each CD-ROM created.

Backup and Storage: to improve the Foreign Trade Division's backup and storage capabilities we have upgraded our equipment. Foreign Trade Division now runs a redundant backup system at the Bowie Computer Center using an ADIC VLS DLT 300 system that are seven cartridge autoloader systems capable of 280GB each. The Headquarters backup system is an ADIC VLS DLT7000 system. Data is stored on 70GB tapes, twice the capacity of the previous system tapes. Full system backups previously took approximately 2.5 days; when the new system is operational, the complete backup will run in one day and storage space for the tapes will be considerably reduced. Augmenting the ADIC system, the Foreign Trade Division has a new Compaq DLT 15-tape library system capable of storing 450GB. All backup subsystems run the same software (Cheyenne ArcServe 6.x with InnocuLAN) to maintain homogeneity. This technology emulates the IT Directorate's Telecommunications Office and allows for emergency support if needed. Foreign Trade Division will move to the Platinum Enterprise Backup System when this system is ready to be used with the Novell networking system.

Help Desk: the Foreign Trade Division has a technical support branch that installs and services PCs, procures equipment for the Division, and services and maintains the Foreign Trade Local Area Network. Currently, the staff receives help requests through telephone calls and an electronic mail message system. Foreign Trade Division has been working toward installing help desk software to service the user community more efficiently. The IT Directorate is implementing Remedy as the U.S. Census Bureau's standard help desk package; we will also use Remedy so we may coordinate our services, more accurately track service calls, and establish a history file of service requests and solutions.

Figure 11, on the following page, depicts the Foreign Trade Division's IT infrastructure.

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Our infrastructure consists of desktop PCs running Windows 95/98 and networked via the TCP/IP protocol and NFS. A single UNIX workstation provides DNS, e-mail, and print services (all other UNIX workstations and servers are dedicated to specific research projects). Our in-house computer staff performs all hardware, software, and networking support.

We have configured all our desktop computer systems around a standard model: Windows 95/98, TCP/IP network access, office suite software, and X Windows software for access to UNIX resources. We have found this model to reduce support difficulties; one full-time employee provides hands-on support for approximately 50 machines. A Sun Enterprise 1 workstation that resides locally provides all e-mail, print, and DNS services; personnel costs for supporting this machine are negligible. All in all, uptime for all machines is well in excess of 99%.

3.2 Economic Program Area Infrastructure Progress Against Planned Milestones

Economic Program Area Infrastructure Milestones, FY 98

Description	Estimated		Actual		Progress to Date
	Start Date	Finish Date	Start Date	Finish Date	
Economic Census and Survey					
LAN and PC Modernization: Economic Document management system: Reevaluate enhancement scheme	04/98	05/98		05/98	Completed.
Modernization of LAN servers: Install/replace MARTS PC file server	10/96	07/98		07/98	Completed.
Modernization of LAN servers: Install/replace domain controllers	10/97	07/98		07/98	Completed.
LAN and PC Modernization - Economic document management system: Roll-out DOCS Open Version 3.7	06/98	07/98		07/98	Completed.
LAN and PC Modernization - Economic Document management system: Upgrade to DOCS client fusion/DOC Open V4.0	06/98	08/98		08/98	Completed.
Foreign Trade Statistics					
SAS Executive Milestone Overview: Development of historical SAS database and related analytical tools – Historical Current year database design	05/98	07/98		11/98	FY 98 project databases completed.
SAS Executive Milestone Overview: Development of historical SAS database and related analytical tools – Historical and current database programming development	06/98	07/98		11/98	FY 98 project databases completed.
SAS Executive Milestone Overview: Development of Historical SAS database and related analytical tools –database evaluation	06/98	07/98		11/98	FY 98 project databases completed.

We have made considerable progress over the past year upgrading our LAN environment. Some of our accomplishments include:

- **upgrading most of our servers to state-of-the-art equipment;**
- **converting our Novell Netware servers to the Netware 4.x operating system;**
- **continuing research on server clustering to provide an augmented level of reliability;**
- **implementing automated backup for all our servers to DLT silos;**
- **installing a temperature alert system in our servers rooms in Headquarters;**
- **developing a plan to migrate our Local Area Network servers and small UNIX workstations to the Bowie Computer Center—relocating this equipment will result in a more conducive environment with enhanced security;**
- **upgrading all our desktop PCs to 200Mhz Pentium or better with a minimum of 64MB of memory and 17" monitors—National Processing Staff is being provided with Pentium 166s or better, also with 64MB of memory and 17" monitors;**
- **implementing automatic software rollout (using the Altis software);**
- **running the Check2000 Y2K software on all our Local Area Network servers (all of which passed). We are developing a plan to run Check2000 for all our PCs without causing disruptions to users;**
- **assisted the Telecommunications Office with installing new wiring and switching hardware for all Economic divisions resulting in a significant improvement in reliability and throughput;**
- **transferring initial help desk contact responsibility to the IT Directorate;**
- **releasing a new version of our Common User Interface to users in the five divisions supported by the Economic Statistical Methods Programming Division;**
- **acquiring and installing the Reflections software for a limited number of users to replace OnNet/XOnNet;**
- **upgrading and implementing new versions of PC-DOCS document management software, including the Internet-based CyberDOCS;**
- **beginning to purchase and install copies of Microsoft Office Professional to prepare for eventual move to this U.S. Census Bureau-wide standard;**
- **installing Cyberdocs on servers to allow access by 35 National Processing Center personnel;**
- **increasing the number of seats using DOCS Open and Cyberdocs to 257;**
- **renewing support contract for DOCS Open and Cyberdocs with contractor; and**
- **planning to upgrade and configure the servers needed to support DOCS for the next three years.**

Economic Program Area Infrastructure Milestones, FY 02					
Description	Estimated		Actual		Progress to Date
	Start Date	Finish Date	Start Date	Finish Date	
LAN and PC Modernization					
Production LAN server replacement: Start with five then continue with the replacement scheme only purchasing 3 larger servers each year. This will slowly reduce the number of reverse we have and centralize management and processing on fewer/larger machines. (HQ and Jeffersonville)	01/02 (3)	09/02			

Economic Program Area Infrastructure Milestones, FY 03					
Description	Estimated		Actual		Progress to Date
	Start Date	Finish Date	Start Date	Finish Date	
LAN and PC Modernization					
Production LAN server replacement: Start with five then continue with the replacement scheme only purchasing 3 larger servers each year. This will slowly reduce the number of reverse we have and centralize management and processing on fewer/larger machines. (HQ and Jeffersonville)	01/03 (3)	09/03			

3.3 Economic Program Area Infrastructure Performance Measures

Economic Program Area Infrastructure Performance Measures			
Performance Goal	Performance Measure	Target Performance	Current Performance
New Common User Interface (CUI) deployment	Number of workdays to deploy new CUI to all users	5 workdays	
LAN server availability	Uptime for all Economic program area LAN servers	99%	
Office of the Chief Economist			
User satisfaction	Percent of trouble reports resolved within 24 hours	95%	90%*

*estimated from Computer Staff logs.

Another risk is the failure of LAN server environment. We currently have over 30 servers supporting production and office automation processing. These servers are a combination of Netware and NT operating systems that can result in potential coordination and configuration problems. When any of these machines go down, there is a disruption in processing, which may range from minor to critical depending on the day of the month.

Our risk mitigation strategies include the following:

- **for critical production servers, we have established contingency machines that can replace damaged hardware;**
- **maintaining two operating environments (Netware and Windows NT) to use the best features of each for our varied processing requirements;**
- **establishing standardized software and hardware environments within Netware and NT;**
- **installing a tape silo to bolster our backup capacity and create a more reliable and robust backup environment;**
- **planning to install larger capacity systems to replace multiple smaller machines. This will reduce the system management burden; and**
- **implementing clustered environments for the LAN servers to enable resource sharing and establish failover capability.**

The last risk is maintaining a stable desktop environment. As our processing requirements grow, new technologies mature into viable production tools and software functionality expands, we must continually refresh and upgrade our desktop systems. The challenge is to avoid disruptions to the users during this process and minimize the risk of outages during critical processing periods.

Our risk mitigation strategies include the following:

- **establishing a standardized Common User Interface for all users to maintain better control over the desktop environment and facilitate problem resolution;**
- **deploying an automated software rollout process for the desktops PCs;**
- **continuing to research best in class desktop PCs;**
- **improving the coordination of help desk services between Economic Statistical Methods and Programming Division staff and the IT Directorate;**
- **maintaining a continuous age replacement cycle that allows us to keep one third of our equipment state of the art; and**
- **establishing a Directorate-wide committee that recommends and approves software changes to our desktop environment. This lets the users have input to the process and understand the difficulty of maintaining proper software support.**

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The greatest risk associated with any group of personal computers is that of data loss due to hardware failure. We are currently minimizing this risk by installing software to automate backups of individual office automation and PC-based project data.